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Optimality of AIC in inference about Brownian motion

Abstract In the usual Gaussian White-Noise model, we consider the problem of estimating the unknown square-integrable drift function of the standard Brownian motion using the partial sums of its Fourier series expansion generated by an orthonormal basis. Using the squared L_2 distance loss, this problem is known to be the same as estimating the mean of an infinite dimensional random vector with l_2 loss, where the coordinates are independently normally distributed with the unknown Fourier coefficients as the means and the same variance. In this modified version of the problem, we show that Akaike Information Criterion for model selection, followed by least squares estimation, attains the minimax rate of convergence.